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Alternative technology niches and sustainable development: 12 years on.

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Abstract

This article provides brief, personal reflections on developments in the research fields of sociotechnical transitions theory and grassroots innovation since publication of the article *Alternative technology niches and sustainable developments*. What is striking about work since then is the importance for sustainable development of interaction and contestation between diverse approaches to innovation. Rather than looking for general models for sustainable innovation, research can fruitfully understand interactions and exclusions between diverse approaches. Undertaken critically and reflexively, such work sheds light on the wider social structures that inhibit a more democratic innovation politics.

Keywords: grassroots innovation; sociotechnical transition; sustainable development; diversity; politics.

Introduction

It is both an honour and gratifying to have my article (Smith 2004)included in this retrospective special section. I am delighted the editors found it worthy of inclusion. At the time I wrote the article my research was beginning to grapple with a theoretical domain and empirical topic both new to me. As usual, both had thrown me into considerable confusion. Writing the article was my attempt to make sense of their connection, and to test whether such analysis might be useful for others.

The theoretical domain involved ideas for how deep and broad 'sociotechnical transitions' happen in societies, and explanations for steering these 'systems innovations' in more environmentally sustainable and socially just directions (in areas as wide-ranging as energy, food, housing, manufacturing, leisure etc). The empirical topic was grassroots innovation, and the kaleidoscope of community groups developing solutions that embody their aspirations and values for different kinds of sustainable developments, oriented to purposes quite different to conventional, firm-based innovation systems, and undertaken in ways that contrast with conventional notions of good innovation practice.

I was not alone in taking interest in either sociotechnical transitions research or grassroots innovation. Limited space means a review of each is impossible (see: Smith et al. 2010 and Smith & Ely 2015 cf Díaz-García et al. 2015). Instead, I make a few personal reflections.

Sociotechnical transitions

The networks of researchers, projects, articles, and advisors making use of ideas in sociotechnical transition have grown enormously.[1] In part, I think these ideas gained traction because key institutions recognise mounting pressure to address deep-seated challenges in societies, and whose response calls for some profound transformations in the way they undertake economic activity and cultivate social life. Presenting the challenges as an opportunity for innovation casts them as more palatable to elites compared to, say, calls for redistributing economic and political power. In practice, systems innovation involves redistributions of power.

An obvious social challenge is climate change and the need to decarbonise sociotechnical systems in areas as fundamental as energy, transport, housing and food. All sorts of winners and losers are being created. Some losers are powerfully positioned and unwilling to innovate. Another challenge is developments in new technologies in societies, and the consequences features like automation will have for livelihoods and social equality. Key ideas in transitions theory - that technologies are socially shaped through heterogeneous processes interacting at multiple levels, and thus technologies form one part of a much broader sociotechnical system that needs active governing – reminds us that there is nothing automatic about automation, nor nothing neutral about low carbon innovation. It is a matter of social choice whether and how we develop innovations in societies and manage the consequences. The sociotechnical transitions literature provides conceptual tools to help inform the governance arrangements for making those choices.

Grassroots innovation

That brings me to grassroots innovation. My initial project was called, *Supporting and harnessing diversity? Experiments in alternative technology* (Smith 2007). It produced the paper in this retrospective. The project looked at grassroots innovation in the domains of housing, food and energy. A subsequent project looked further into community energy (Smith et al. 2015). I am currently fascinated by the world of grassroots digital fabrication, and the rapid spread of community-based design and fabrication workshops (variously known as makerspaces, fablabs and hackerspaces), and nascent movements in open hardware and citizen science (Hielscher & Smith 2014). Whilst each topic is distinct, they do share some fundamental features and challenges, and can all be seen as currents within broader movements of grassroots innovation.

Collaboration with colleagues in Argentina, India, and Colombia enabled us to look across six broader grassroots innovation movements mobilised at different times in South America, India and Europe (Smith et al. 2016). Activists involved in these movements seek to develop innovation in society in ways very different to those recommended by, say, OECD handbooks on Innovation Systems, or the received wisdoms of Silicon Valley. Innovation that appears to work well in conventional market-institutional terms, is working very badly for these communities in terms of

[1] See, for example, the journal Environmental Innovation and Societal Transitions, and the system innovation project at OECD (https://www.innovationpolicyplatform.org/system-innovation-oecd-project).

their environmental, social or economic aspirations. Grassroots innovation movements bring these concerns to the fore, as the motivating factor and central concern for innovation, rather than a side effect to be ameliorated.

Diversity, values and politics in innovation

One example we have looked at is workers involved in the Lucas Plan in the UK in the 1970s, and the associated movement for socially useful production (Smith 2014). Faced with unemployment and decline in manufacturing communities, these activists developed alternative approaches to new technology that were more human-centred, and oriented to producing goods for social use rather than market exchange. Whilst ultimately unsuccessful in realising their vision, this radical, short-lived niche did nevertheless pioneer techniques in participatory design that have become widely influential, and their prototypes for heat pumps, wind turbines and hybrid cars were ahead of their time.

This is a typical feature of radical innovation niches. The alternative vision and values they hold creates space and mobilises resources for doing innovation very differently. These spaces permit all sorts of novelties to arise, by addressing issues and using methods that are either overlooked, threatening or unprofitable to conventional innovation systems. Some elements of niche practices do take off, and can become mainstreamed. However, for the overall movement to take root – for the alternative principles to become a new norm in society – then changes in culture and social structure are needed that are beyond the agency of activists, and which are actually beyond the scope of innovation policy too.

The example given in the paper is wind turbine development. Turbines have developed rapidly, but appropriated to a utility-based model different to the local co-operative forms of ownership that were central to the sociotechnical configurations of early pioneers. The motivating vision for democratically controlled decentralised energy systems is a long way from the interests mobilising investment in green tech. To some of us, wind turbines are a successful innovation-diffusion from margins to mainstream. To the more idealistic of us, the path taken signals a disappointing co-option of ‘soft energy’ (Lovins 1976). Renewed interest in community energy is a response that seeks more social inclusion in energy transitions.

Interestingly, all these moves are dependant upon the others. Without the radical idealists, the appropriable novelties available to institutionally constrained business would be fewer; and without problematic co-options within the mainstream, the idealists would have no ‘other’ against which to innovate. Since my 2004 article, I’ve been trying to trace and understand this more dynamic view of a plurality of contested innovation alternatives. The importance of diverse values and approaches in innovation is critical. The more marginal, countercultural approaches introduce important diversity – but not exclusively. As a result, the concept of interacting niche spaces, where the rules are different, and what happens within and beyond these spaces – indeed, how they are constituted – has for me been the more fruitful of the concepts within sociotechnical transitions theory (Smith & Raven 2012).

Conclusion

Innovation studies need to be lifted up above the search for best models and good practices. We need to look at interactions, flows and contestations between different innovation spaces. And we need to do so more critically. Not in the sense of pointing to the failures or problems of innovation alternatives, nor deconstructing the forces that produce or thwart them (though that is important). Rather, I mean critical in the sense of directing attention away form the innovation itself, and seeing these innovation alternatives as bellwethers in societies: an active expression that points to what is not working with more established innovation models.

Thinking about the institutional changes required to restructure and democratise relations between these various forms of innovation does, I think, help us approach the deeper challenges in transforming social, economic and political power required for sustainable developments. It also points to the limits of innovation (something recent enthusiasm for social innovation should bear in mind), since such structural changes are typically brought about through political organisation and mobilisation.

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